



EUSALP EU STRATEGY FOR THE ALPINE REGION

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Electromobility as a Challenge for Power Grids

Case Study Vorarlberg

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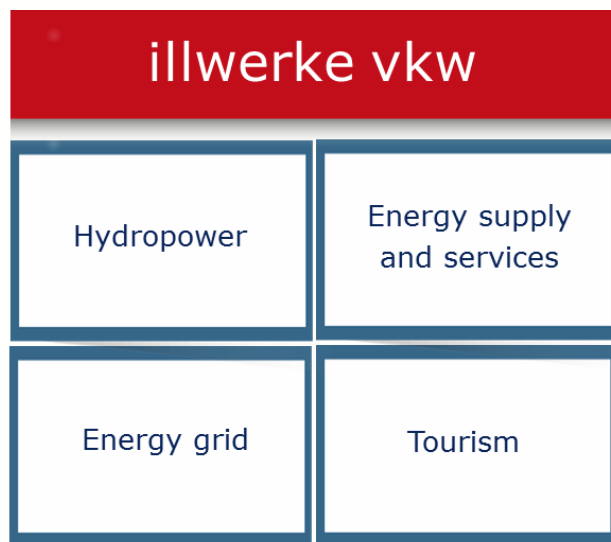


80 million people, 7 countries, 48 regions,
mountains and plains addressing together
common challenges and opportunities



This project is co-financed by the European Union via Interreg Alpine Space

Business: illwerke vkw



VKW Mobility: Products and Services

Mobility center: point of contact for everybody

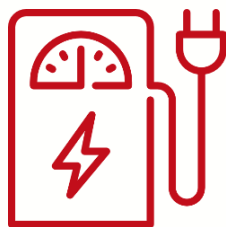
Charging solutions for apartment buildings, electric fleets, ...



Installation and operation of charging infrastructure

Infrastructure management for utilities (CPO and CSO)

more than **400**
electric charging points in Vorarlberg



since **2009**
experience in e-mobility
(start project „VLOTTE“)



2.34 %
of all new **registrations** in the **electric car sector** in Vorarlberg in 2016



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Impacts of E-Mobility on the Energy Industry

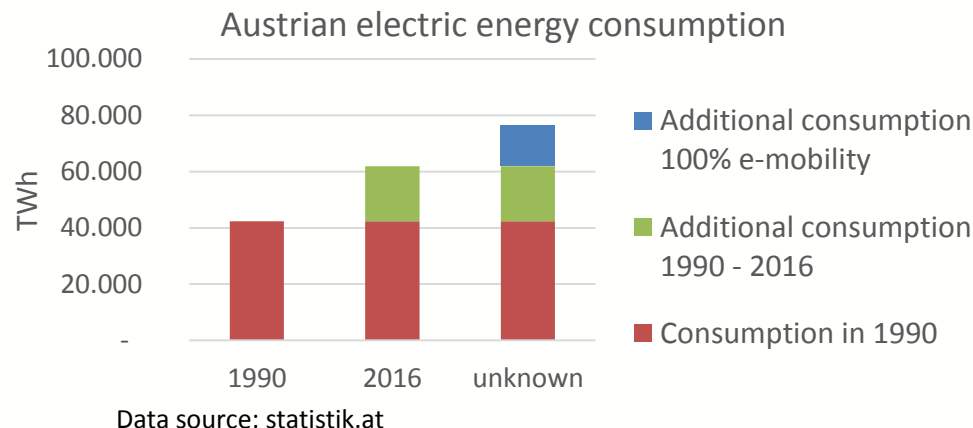


5 million passenger cars

14'500 km / year

20 kWh / 100 km

~ 14.5 TWh



~ 24% of the Austrian electric energy consumption 2016



Electricity must be distributed to the customers

What Charging Electric Cars will look like



40 – 100 kWh capacity



11 – 350 kW charge power



What Charging Electric Cars will look like

Slow Charging

- At home / at work
- E.g., ski resorts, ...
- Long parking time
- 11 – 22 kW AC

Fast Charging

- At points of interest
- Medium parking time
- 50 kW DC

High-Power-Charging

- Close to traffic junctions
- Along highways
- 150 – 350 kW DC

Resulting Challenges for the Electricity Grid



High-Power-Charging along highways

- Large charging parks
- Own transformer station



Urban charging

- Integration in existing distribution grids
- Partial grid expansion



Resulting Challenges for the Electricity Grid

Probability of a voltage level undercut			No risk	Low risk	High risk
Type of grid region	Rate of low tariff charging power	5% e-cars	10% e-cars	15% e-cars	20% e-cars
Rural grid (small rural village) e.g., 500 inhabitants	50% low tariff 11 & 22 kW				
	0% low tariff 11 & 22 kW				
	Small power charging until 5:00 a.m.				
Suburban grid (periphery) e.g., 5000 inhabitants	50% low tariff 11 & 22 kW				
	0% low tariff 11 & 22 kW				
	Small power charging until 5:00 a.m.				

It is hard to assess
 what charging
 behavior will look like

Important Findings from our own Experience



Coordinated charging

Cars must not charge with highest possible charging power when parked for a long time



Load management

Use of charging devices which are capable of load management is necessary



Acceptance of user demands

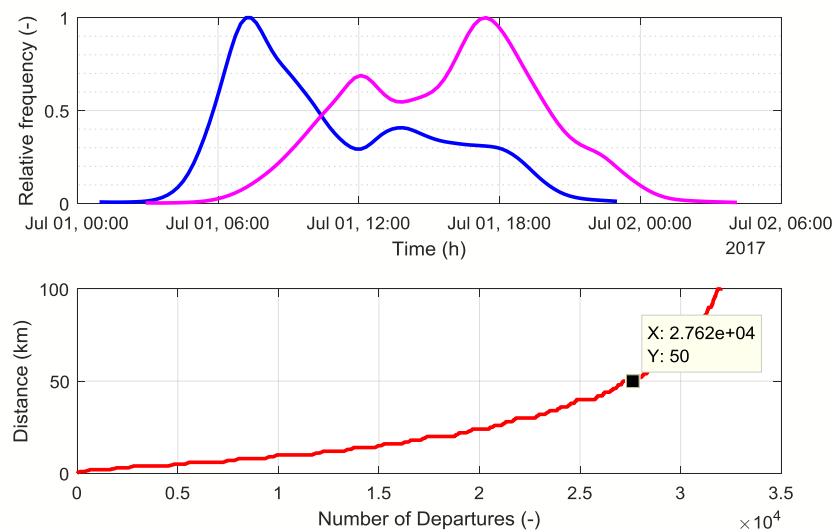
DSOs need to accept 11 kW as standard slow charging power and they should strive to make it possible

Load Management 1.0

Load management in apartment houses, electric fleets, ...

- All parties share the same interest
- An operator takes care of the load management as a service

→ simple to handle, already in action



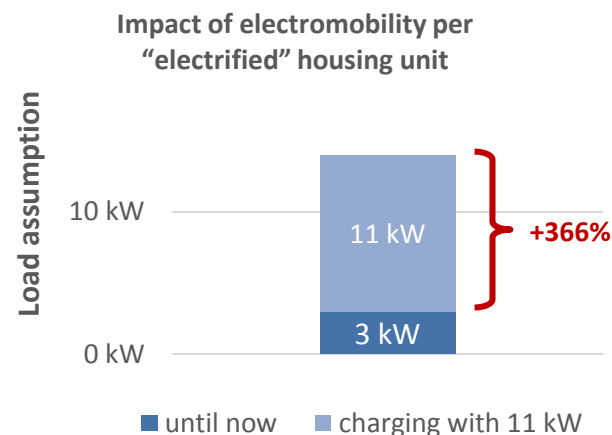
Load Management 2.0



Load management in distribution grid feeders

- Many different charging stations
- Hard to manage all parties

→ no technology available yet



Recommendations for EUSALP



Please take it seriously – E-Mobility is coming

- Announcements of industry and politics



Reasonable designed legal framework

- Simplified home charging, but prevention of load peaks



Try it out

- Communicate and gain experience



Official excerpt from the
new guide of the Ministry
of Transport, Innovation
and Technology